

MATHEMATICAL PROCESS—REPRESENTING



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Students will create a variety of representations of mathematical ideas (e.g., numeric, geometric, algebraic, graphical, pictorial; on-screen dynamic representations), connect and compare representations, and select and apply the appropriate representations to solve problems.

Students represent mathematical ideas and relationships and model situations using concrete materials, pictures, diagrams, graphs, tables, numbers, words, and symbols. Learning various forms of representation helps students to make connections and develop flexibility in their thinking about mathematics.

ROLE OF STUDENTS

- Select an appropriate representation and defend their choice:
 - Physical/concrete/manipulative
 - Electronically generated, e.g., graphs, dynamic geometry representation
 - Mental image
 - Numerical, e.g., table of values
 - Graphical
 - Scale drawing
 - Diagram
 - Graphic organizers, e.g., Venn diagram, T-chart, concept map
 - Equation/algebraic expression/formula
 - Algorithm/logic model
- Understand that various representations can be used to represent the same situation appropriately.
- Understand that there may be different variations of one representation, e.g., algebraic expressions may be equivalent yet appear different.

SAMPLE QUESTIONS

- What would other representations of this problem demonstrate?
- Explain why you chose this representation.
- How could you represent this idea algebraically? Graphically?
- Does this graphical representation of the data bias the viewer? Explain.
- What properties would you have to use to construct a dynamic representation of this situation?
- In what way would a scale model help you solve this problem?

SAMPLE FEEDBACK

- Show how you can represent this situation more efficiently.
- How can your representation of the data include your outliers?
- In what other way(s) can you represent this problem?